

Claim 11 stands objected to because of an informality. Applicant has amended that claim to attend to the matter noted in the Office Action as giving rise to the objection.

Claims 1-6 stand rejected under 35 U.S.C. § 102 based upon public use or sale of the invention, in view of the Examiner's general knowledge of the art. Claims 7-10 stand rejected under 35 U.S.C. § 103 over any one of the documents provided by the Examiner which were printed from the websites of Wang BioMedical (Wang), Edmund Industrial Optics (Edmund), and Oriel Instruments (Oriel), in further view of U.S. Patent No. 6,268,904 (Mori, et al.). Claims 11, 12, and 16 stand rejected under 35 U.S.C. § 103 over the Wang, Edmund, or Oriel documents, in further view of the Mori, et al. and the Examiner's general knowledge of the art. Claims 13-15 stand rejected under 35 U.S.C. § 103 the Wang, Edmund, or Oriel documents, in further view of U.S. Patent No. 5,315,793 (Peterson, et al.). Applicant traverses these rejections.

As recited in independent Claim 1, Applicant's invention is directed to an optical instrument having an optical element, a detector, ozone supplying means, and cleaning means. The detector detects an impurity concentration in an ambience of a space surrounding the optical element. The ozone supply means supplies ozone into the ambience. The cleaning means cleans the ambience by use of the ozone, when the impurity concentration detected by the detector is not less than a predetermined value.

As recited in independent Claim 17, Applicant's invention includes, *inter alia*, cleaning means for cleaning an ambience by projecting light to oxygen supplied to the ambience by oxygen supplying means, to produce ozone or active oxygen, when a detector detects that an impurity concentration is not less than a predetermined value. Independent

Claim 22 includes cleaning means that cleans the ambience by generating a photochemical reaction by projecting light into the ambience using light projecting means, when the detected impurity concentration is not less than a predetermined value. Independent Claim 27 includes cleaning means arranged to generate a photochemical reaction by use of a photo-catalyst, thereby to clean the ambience, when the detected impurity concentration is not less than a predetermined value.

With respect to the statement in the Office Action of the Examiner's general knowledge of the state of the art, Applicant submits that it is not known by the public to provide any one of the particular cleaning means now recited in the independent claims to clean an ambience of a space surrounding an optical element. In addition, Applicant submits that the Wang document merely discloses removing dust from optical surfaces using pressurized air or nitrogen. The Edmund document is directed to the importance of cleaning optics and generally discusses using pressurized gas to clean an optical surface. The Oriel document is directed to a spray cleaner for cleaning optical instruments. Applicant submits, however, that those documents do not describe any of the specific cleaning means for cleaning an ambience of a space surrounding an optical element.

The Mori, et al. patent is cited in the Office Action as disclosing a cleaning method in which UV light is used in an optical cleaning device. The Peterson, et al. patent is merely cited in the Office Action as describing a detector for detecting concentrations of organic substances. Again, however, Applicant submits that these patents do not disclose the specific cleaning means now recited in the independent claims.

Accordingly, Applicant submits that the Wang, Edmond, and Oriel documents, and the Mori, et al. and Peterson, et al. patents, taken alone or in combination,

fail to disclose or suggest, at least, (i) cleaning means for cleaning the ambience by use of ozone supplied by ozone supplying means, when the impurity concentration detected by a detector is not less than a predetermined value, as recited in independent Claim 1; (ii) cleaning means for cleaning the ambience by projecting light to oxygen supplied by oxygen supplying means, to produce ozone or active oxygen, when the impurity concentration detected by a detector is not less than a predetermined value, as recited in independent Claim 17; (iii) cleaning means for cleaning the ambience by generating a photochemical reaction in the ambience by projecting light thereto using light projecting means, when the impurity concentration detected by a detector is not less than a predetermined value, as recited in independent Claim 22; (iv) cleaning means arranged to generate a photochemical reaction by use of a photo-catalyst, thereby to clean the ambience, when the impurity concentration detected by a detector is not less than a predetermined value.

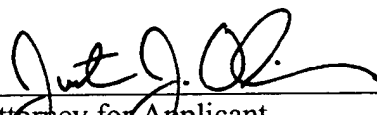
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For the foregoing reasons, Applicant submits that the independent claims are distinguishable over the applied references, and requests withdrawal of the rejections under 35 U.S.C. §§ 102 and 103.

The remaining claims in the present application are dependent claims which depend from the independent claims, and thus are patentable over the documents of record for reasons noted above with respect to those claims. In addition, each recites features of the invention still further distinguishing it from the applied references. Applicant requests favorable and independent consideration thereof.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



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MARKED-UP VERSION OF THE CLAIMS

1. (Amended) An optical instrument, comprising:  
an optical element; and  
a detector for detecting an impurity concentration in an ambience [containing] of a  
space surrounding the optical element;  
ozone supplying means for supplying ozone into the ambience; and  
cleaning means for cleaning the ambience by use of the ozone supplied by said  
ozone supplying means, when the impurity concentration detected by said detector is not less  
than a predetermined value.

5. (Amended) An optical instrument according to [any one of Claims 1 - 4]  
Claim 1, further comprising means for putting the ambience in a state purged with a gas  
substantially not absorbing light to be propagated through the optical element.

6. (Amended) An optical instrument according to Claim 5, wherein the gas  
[comprises a dry air or an inactive gas such as a] is nitrogen [gas and a] or helium [gas].

7. (Amended) An optical instrument according to Claim [6] 5, wherein the light  
comprises deep ultraviolet rays having a wavelength not longer than 200 nm.

8. (Amended) An optical instrument according to Claim 7, wherein the [inactive] gas comprises a helium gas.

11. (Amended) An optical instrument according to [any one of Claims 1 - 4] Claim 1, [wherein said optical instrument is an exposure apparatus including (i)] further comprising means for holding [one of a mark and a reticle, (ii)] a mask, an illumination optical system for illuminating a pattern of the mask [or the reticle] with [the] light from a light source, and [(iii)] means for holding a wafer to be exposed with the pattern of the mask.

12. (Amended) An optical instrument according to Claim 11, [further comprising a projection] wherein said optical element comprises a [system for projecting the pattern onto the wafer with use of the light, wherein said projection optical system is provided by (i) refractive elements only, (ii)] reflective [elements] element only, or [(iii) a] combination of a reflective optical element and a refractive optical element [and reflective elements].

13. (Amended) An optical instrument according to [any one of Claims 1 - 4] Claim 1, wherein said detector has a sensor for detecting a concentration of an organic substance.

16. (Amended) A device manufacturing method, comprising the steps of:  
exposing a wafer [with a device pattern] by use of an optical instrument as recited  
in [any one of Claims 1 - 4] Claim 11; and  
developing the exposed wafer.

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